

Q-Switched Nd:YAG Laser Treatment for Acquired Bilateral Nevus of Ota-Like Maculae: A Long-Term Follow-Up

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Background and Objective: Acquired bilateral nevus of Ota-like maculae (ABNLM) is not an uncommon dermal melanosis in Asian people. It is known for its recalcitrance to conventional treatment. We proposed Q-switched Nd:YAG laser for the treatment of this entity.

Study Design/Patients and Methods: Seventy female patients with ABNLM, who were 25–40 years old (mean, 37 years), were included in a prospective clinical study. Q-switched Nd:YAG laser at fluence of 8–10 J/cm², spot size 2 or 4 mm, and a repetition rate of 10 Hz was used to treat the lesions.

Results: Two patients were lost to follow-up. In the remaining 68 cases, all lesions attained a 100% clearance after two to five treatment sessions (mean, 2.8 sessions). The results had persisted at 3–4 years follow-up (mean, 42 months). Temporary hyperpigmentation was found in 50% of patients; there was no scarring or changing of skin texture.

Conclusion: Q-switched Nd:YAG laser is a safe and effective noninvasive alternative treatment for ABNLM. *Lasers Surg. Med.* 26:376–379, 2000. © 2000 Wiley-Liss, Inc.

Key words: Hori nevus; laser treatment

INTRODUCTION

Acquired bilateral nevus of Ota-like maculae (ABNLM) is prevalent in Asian people. It is predominantly found in women after 20 years of age [1]; the incidence as reported by Sun et al. [2] in Taiwan was 0.8% with a male to female ratio of 1:6. ABNLM differs clinically from nevus of Ota in some aspects, i.e., (1) nevus of Ota is usually a congenital disease or present in the first year of life or rarely in adolescence, whereas ABNLM is an acquired disease; (2) there is no mucosal lesion in cases of ABNLM, whereas oral, nasal, conjunctival, and tympanic membrane pigmentation may be found in cases of nevus of Ota; (3) bilateral occurrence is a characteristic of ABNLM, whereas nevus of Ota is usually found unilaterally. Clinically, this entity is characterized by a cluster of brownish black dermal hyperpigmentation either on both sides of the malar, temple, nasal alar, nasal bridge, or in combination. The typical his-

topathologic finding is the presence of dendritic melanocytes in the dermis. These deep-seated, abnormal pigment-producing cells may explain the difficulty of management. Despite a common occurrence, there is a surprising paucity of published reports concerning treatment of ABNLM. The current treatment regimen, dermabrasion [1], although effective as a single session procedure, was considered an invasive procedure and may not totally address the problem in some patients. Currently, there is no report on laser treatment for this disease. In this study, we determined the efficacy of Q-switched Nd:YAG laser in treating ABNLM.

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PATIENTS AND METHODS

Seventy female patients, who were 25–40 years old (mean = 37 years), were included in the study. The lesions were located bilaterally on the malar areas in all patients; in nine cases, there were simultaneous lesions on other areas such as both temples, the nasal bridge, and nasal alar. A total of 42 patients had Fitzpatrick skin type III, 26 had type IV, and 2 had type V. Topical anesthetic, 2.5% prilocaine plus 2.5% xylocaine (EMLA[®]) was applied 1 hour before the procedure.

The Q-switched Nd:YAG laser unit (Lambda photometrics, England) used in this study has a wavelength of 1,064 nm, pulse width of 25 ns, maximum pulse repetition rate of 10 Hz, and a maximum energy density of 40 J/cm² at 2-mm working spot diameter. The laser parameters used in this study were the following: a fluence of 8–10 J/cm² at 2- or 4-mm spot diameter and a repetition rate of 10 Hz. The choice of spot size was based on the size of the individual lesion, and the predominant size used in this study was 4 mm. The laser fluence was kept constant, regardless of the size of spot diameter used. The end point was determined either by minimal punctated oozing of blood or when the treated area turned homogeneously grayish pink. The lasing pattern was spot by spot, leaving the intervening uninvolved areas intact. Postoperatively, dressings were not used and a topical antibiotic cream was applied for a few days. Patients were instructed to avoid exposure to direct sunlight and to wear sunscreen cream for 2–3 months, postoperatively. The next session of treatment was scheduled as early as the second or third week after the first session. However, in the patients who developed postoperative hyperpigmentation, topical 4% hydroquinone was prescribed and the consecutive treatment would ensue only when the hyperpigmentation had cleared. The number of treatment sessions was determined by total clearance of the lesions. Follow-up was scheduled every week for the first 2 months after the procedure, then every 1–2 months thereafter. The final clinical evaluation was at 3–4 years postoperatively (mean, 42 months), either by visit or by a phone call. Preoperative and postoperative photographs were also taken.

RESULTS

Intraoperatively, there was immediate minimal punctate bleeding on the treated area in most

patients. The degree of such oozing was variable, i.e., it was increased for patients with dark skin color or when higher fluence was used. However, bleeding stopped spontaneously within a few minutes without applying any pressure. A clustered pinpoint crust may be observed, which fell off within a few days postoperatively. Hyperpigmentation appeared on the second or third week in 50% of patients, particularly in those who developed more crust. However, this hyperpigmentation responded readily to topical 4% hydroquinone cream within a few days to weeks of application. Two to five treatment sessions (mean, 2.8 sessions) were required for complete clearance of the lesions. Of 70 patients, 2 were lost to follow-up 2–3 months after total clearance of the lesions. Sixty-eight cases were available for final evaluation at 3–4 years postoperatively. Among these 68 patients were 49 patients who could visit personally for a clinical evaluation and 19 patients who could be followed up by a phone call. All lesions in every patient were completely cleared. None of them had abnormal pigmentation or change of skin texture (Figs. 1 and 2). No recurrence was observed in any patient within the follow-up period.

DISCUSSION

The diagnosis of ABNLM is rarely missed because of its typical clinical presentation as previously reported [1,3]. The differential diagnoses include nevus of Ota, dermal melasma, and the group of female facial melanosis. The former condition was mentioned earlier, and the latter two may be differentiated from ABNLM by the appearance of a blotchy brownish pigment distributed homogeneously in the lesions. Histologically, only dermal melanin and melanophages but no dermal melanocytes are found in melasma and the female facial melanosis group. This finding is in contrast to ABNLM and nevus of Ota as described earlier. Occasionally, if required, wood lamp and examination of biopsy specimens allow the unequivocally diagnosis. All patients in this series were females. This finding probably could supported the hormonal concept as a possible influential factor, as previously described [1]. This entity is well known for its recalcitrance to the conventional treatment. Camouflaging with cosmetics is the most simple method to hide the lesion temporarily, but is far from an ideal solution. Cryotherapy had been mentioned [3] but poses a

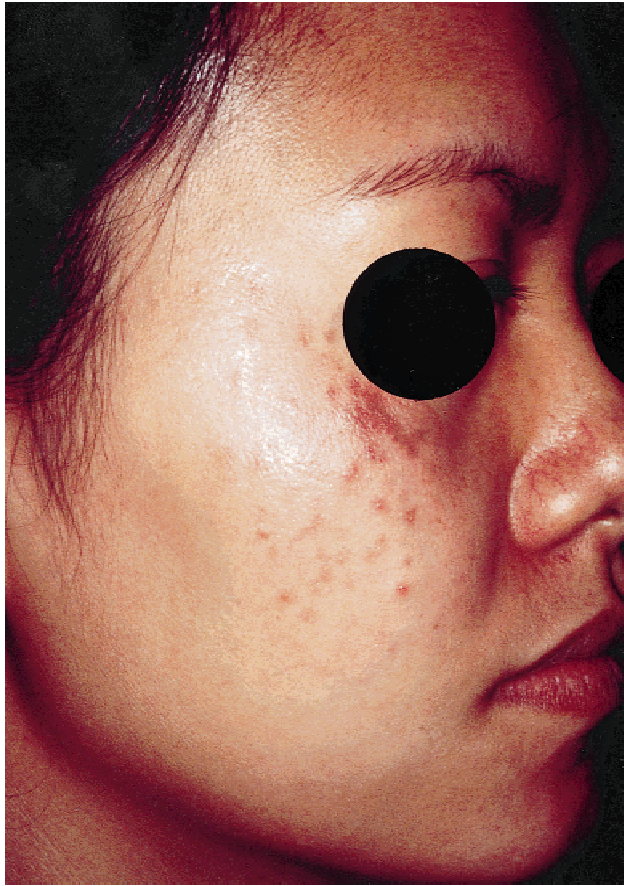


Fig. 1. Preoperative views of acquired bilateral nevus of Ota-like maculae lesions in (**top**) a 22-year-old patient and (**bottom**) a 30-year-old patient.

high incidence of permanent hypopigmentation and scarring.

Dermabrasion was the most promising approach for most patients. Despite its advantage as a single-session procedure [1], a certain percentage of patients could not accept it, simply because they perceived it as invasive surgery. Based on our personal experiences, we found that a continuous-wave carbon dioxide laser could ab-



Fig. 2. Four years postoperatively, after three sessions of treatment. Note the complete clearance of the lesions without scarring or abnormal pigmentation.

late this lesion, but an atrophic hypopigmented scar was a constant consequence. A Q-switched Nd:YAG laser had been used to treat nevus of Ota [4–7]; however, there were no published reports of treatments of ABNLM with this laser. The Q-switched Nd:YAG laser has a wavelength within near-infrared range of electromagnetic spectrum. The Q-switched mode allows emitting of an extremely high energy within a short period of time.

The 1,064-mm wavelength is mainly selectively absorbed by melanin-containing chromophores and was able to penetrate deep in the dermis [8]. The mechanism of action is primarily of shock-wave destruction rather than heat production.

The Q-switched, nanosecond pulses cause selective melanocyte injury through acoustic shock waves. This form of photomechanical reaction is thought to be responsible for the selective disruption of melanosomes [9]. This mechanism would likely explain the zero incidence of skin texture change and scarring in this study. In the patients who developed postoperative hyperpigmentation before total clearance of the ABNLM, because of competing absorption of laser energy, the hyperpigmentation occurs before consecutive treatments should be treated first by a bleaching agent. This could probably reduce the number of treatment sessions. The possibility of immediate postoperative punctate bleeding and a temporary postoperative hyperpigmentation should be explained well to all patients before the procedure. The effective strategies to prevent postoperative hyperpigmentation probably is to avoid direct exposure to sunlight, routinely to wear sunscreen cream, and to apply topical hydroquinone early, preferably commencing a few days after treatment. We could not definitely relate the incidence of hyperpigmentation to the laser fluence and skin color, although we observed hyperpigmentation more consistently in darker skin with a higher fluence. This finding may suggest that a lower fluence might be safer in a patient with dark skin.

CONCLUSION

The Q-switched Nd:YAG laser is a safe and valuable tool for the treatment of ABNLM. A high

incidence of temporary hyperpigmentation is well accepted by most patients.

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